

5.0 ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES CONSIDERED

While consultation has been reinitiated on the BO and until a new BO is completed, NMFS is implementing emergency regulations, based on historical data on turtle interactions, to reduce anticipated effects of the pelagic longline fishery on sea turtles. Therefore, NMFS has considered several alternatives that will reduce the bycatch of sea turtles, as well as measures that will reduce the serious injury of those sea turtles that are unavoidably captured, in the Atlantic HMS pelagic longline fishery. This emergency rule only applies to vessels that use pelagic longline gear and that have been issued Federal HMS permits; however, NMFS intends to work with the regional fishery management councils to ensure consistency for all vessels that use pelagic longline gear.

5.1 Measures to Reduce Bycatch of Sea Turtles

Alternatives discussed in this section examine ways to reduce the overall bycatch or takes of sea turtles in the Atlantic pelagic longline fishery through time and area closures and gear deployment restrictions.

Final Action: Closure of a 2°x 2° area and a 2°x 6° area (“L-shape”) in NED area to pelagic longlining for the duration of the emergency rule¹ beginning October 8, 2000

This action will close an “L-shape” area of 55,970 square miles, consisting of a 2°x 2° area (41°N. lat. to 43°N. lat. and 47°W. long. to 49°W. long.) and a 2°x 6° area (43°N. lat. to 45°N. lat. and 43°W. long. to 49°W. long.), within the NED area (Figure 5.1) for the duration of the emergency rule beginning October 8, 2000, to pelagic longline fishing. This action will reduce loggerhead and leatherback sea turtle interactions with pelagic longline gear during the fourth quarter of 2000 and the first quarter of 2001. Compliance with this action will be enforced through the use of United States Coast Guard at-sea resources, such as cutter patrols and fly-overs. This action is consistent with National Standard 9 by reducing, to the extent practicable, the bycatch of sea turtles captured in the Atlantic pelagic longline fishery.

Ecological Impacts

Observer and logbook data from pelagic longline vessels in the NED area in the third and fourth quarters (July to December) show high levels of sea turtle bycatch over the past several years. For example, for 1998 and 1999 combined, the NED area accounted for approximately 80 and 70 percent of loggerhead and leatherback takes in the pelagic longline fishery, respectively (Table 5.1). Additionally, Hoey and Moore (1999) stated that in many cases, two or more sea turtles have been caught per longline set in the NED area, which indicates that pelagic longline fishing in this area poses a potentially greater risk to listed species of sea turtles than pelagic longline fishing

¹Emergency rules are effective for 180 days from the date of publication in the Federal Register. Emergency rules may be extended for an additional 180 days if notice and comment are provided.

in other areas (where multiple sea turtle takes per set are less frequent). Hoey and Moore (1999) found that the NED area was the only area where four or more sea turtles were caught on a single set, and that 19 sets each caught three sea turtles and 22 sets each caught two sea turtles (contrasted to the mid-Atlantic Bight (MAB) and Northeast Coastal (NEC) areas where three sets each caught three sea turtles and 11 sets each caught two sea turtles).

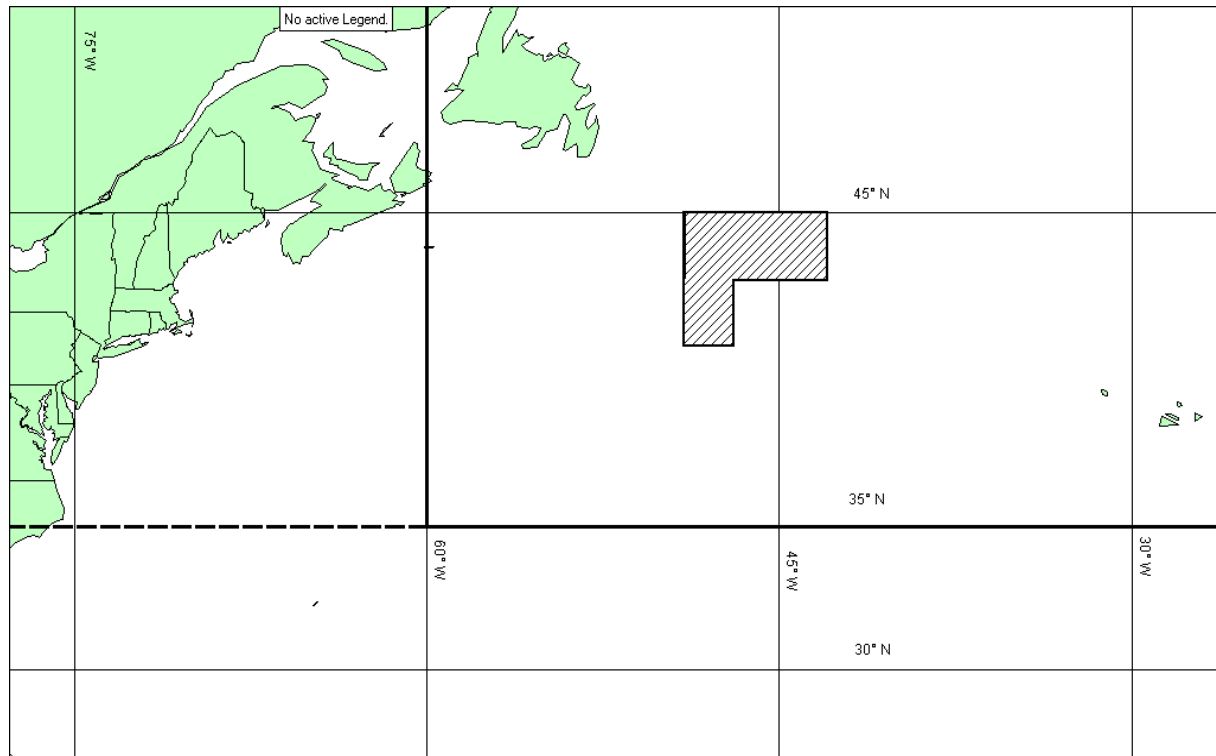


Figure 5.1 “L-shape” closure area within the NED area (approximately 55,970 square miles). The dashed line indicates 35° N. lat. and the solid line indicates the southwestern portion of the NED area (NED extends to 20°W and 55°N).

Table 5.1 Percentage of total Atlantic catch, 1998 and 1999, by area for bycatch and target species (based on logbook reports).

Area	Average monthly number fishing vessels in area	Percentage of Total Atlantic Catch, 1998 and 1999						
		Number of Hooks	Loggerhead turtles	Leatherback turtles	Swordfish kept	Yellowfin tuna kept	Bigeye tuna kept	Blue sharks caught
NED	6.4	5.5%	80.1%	70.4%	19.1%	0.1%	5.7%	31.6%
MAB	26.7	25.9%	16.5%	13.5%	12.8%	23.8%	66.9%	56.8%
Remainder of Atlantic	96.3	68.6%	3.4%	16.1%	68.1%	76.1%	27.3%	11.5%
Total		15.18 million	1,121	267	132,880	119,016	40,301	69,544

The “L-shape” closure area was chosen based on an examination of historical areas, or “hotspots,” with high rates of sea turtle bycatch in both observer data and logbook reports for the NED area from 1992 to 1999. Substantial overlap occurred between the observer data and logbook reports in five 2°x2° blocks between 41° N. lat. to 47° N. lat. and 43° W. long. and 49° W. long. The analysis considered the potential reduction in the number of sea turtles captured by week beginning the first week in October as well as the potential loss of swordfish caught (Table 5.2). Using this matrix, NMFS chose a time and area combination that yielded the greatest reduction in sea turtle takes while still affording the distant water pelagic longline fleet some advanced notice of the time and area closure (see Figure 5.1). For a detailed discussion of the analyses undertaken, see Appendix 1.

Consistent with National Standard 9, this action could reduce the number of incidentally captured loggerhead and leatherback sea turtles in the NED area by approximately 33 percent under a redistribution of effort assumption and by approximately 45 percent under a no-redistribution of effort assumption (Table 5.2). These reductions are estimated from the 26,397 swordfish that were caught and 496 sea turtles that were taken from 1992 to 1999 as reported in pelagic logbook database from vessels that reported fishing in the NED area from October through March. The degree of sea turtle bycatch reduction realized in any given year will depend on the environmental conditions that aggregate sea turtles. For example in 1998, if the L-shape closure had been in effect, the sea turtle reduction would have been between 8 and 41 percent (depending on effort redistribution; see Appendix 1). Similarly, in 1999, the reduction would have been between 14 and 20 percent. To the extent that the L-shape closure area coincides with environmental conditions that aggregate sea turtles in a given year, this closure could accrue substantial reductions in sea turtle bycatch.

Table 5.2 Comparison of nine different time and area closure options examined under the effort redistribution and no effort redistribution model using 1992 to 1999 logbook reports. The final action is in bold. Values presented are the reduction in animals taken in both number and percent.

Area	Dates closed	Turtle reduction No redistribution	Turtle reduction Redistribution	Swordfish reduction No redistribution	Swordfish reduction Redistribution
43-45 lat, 43-49 long (2x6 degree)	October 1 - March 31	239 (48.2%)	187 (37.7%)	11,048 (41.9%)	3,676 (13.9%)
	October 8 - March 31	157 (31.7%)	112 (22.5%)	9,431 (35.7%)	2,978 (11.3%)
	October 15 - March 31	112 (22.6%)	78 (15.7%)	6,757 (25.6%)	1,888 (7.2%)
41-45 lat, 45-47 long (4x4 degree)	October 1 - March 31	315 (63.5%)	243 (49.0%)	12,717 (48.2%)	4,233 (16.0%)
	October 8 - March 31	174 (35.1%)	117 (23.6%)	10,868 (41.2%)	3,429 (13.0%)
	October 15 - March 31	108 (21.8%)	63 (12.8%)	7,961 (30.2%)	2,304 (8.7%)
41-43 lat, 47-49 long and 43-45 lat, 43-49 long (2x2 and 2x6 degree)	October 1 - March 31	368 (74.2%)	302 (61.0%)	14,235 (53.9%)	4,911 (18.6%)
	October 8 - March 31	223 (45.0%)	165 (33.3%)	12,263 (46.5%)	4,036 (15.3%)
	October 15 - March 31	125 (30.6%)	108 (21.8%)	8,982 (34.0%)	2,746 (10.4%)

Economic and Social Impacts

This action is expected to reduce swordfish landings from the NED area for the fourth quarter of 2000 and first quarter of 2001 by approximately 15 percent under the redistribution of effort assumption and by approximately 46 percent under the no-redistribution of effort assumption. There is the possibility that there will be no reduction in swordfish catches due to the closure because the fishermen may compensate by catching more fish outside the closed area. Because this assessment is based upon the historical levels of catch; when only one year is examined, expected swordfish reductions may increase or decrease depending on environmental conditions and fishing opportunities. These estimates provide a range of potential impacts of the final action. The redistribution of effort assumption provides a lower estimate of reduced swordfish landings because fishing effort is expected to shift to areas surrounding the L-shape area, where catch rates

of swordfish are slightly higher. Many of the distant water pelagic longline vessels already fish outside the L-shape closed area so that increases in fishing costs may be minimized.

Given the limited notice of the L-shape closure in the NED area, some distant water vessel owners may chose to shorten the length of their NED area trips or may chose to fish alternate fishing grounds entirely (Caribbean). In these cases, direct impacts may include increased costs and reductions in revenues of captains and crew due to inability to fish the expected length of time in L-shape area. Additionally, if vessels relocate to alternate fishing grounds, fishing costs and revenues may increase or decrease depending on catch rates, the cost of supplies, and market conditions in that area. Dealers that purchase fish from distant water vessels in the fall may experience reductions in revenues if those vessels move to other fishing grounds due to the closure. On the other hand, revenues may increase in other areas if the distant water vessels relocate to alternate fishing grounds earlier than usual.

For those distant water vessel owners and captains that chose to fish in the NED, but outside the L-shape closed area, NMFS strongly urges the captains and crew to be aware of environmental conditions that tend to aggregate sea turtles and to alter fishing practices if a sea turtle is caught. Hoey and Moore (1999) suggest that attention to environmental conditions along frontal systems and attempts to fish in the coldest water available with deeper gear rigs once turtles have been encountered provide the best opportunity to limit subsequent turtle catches.

Monitoring of the closed area will be accomplished by the United States Coast Guard through the use of at-sea resources, such as cutter patrols and fly-overs. In the future, VMS might be utilized as a method of enforcing closed areas.

Conclusion

Given the available data, a precise prediction of the reduction in sea turtle bycatch attributable to the L-shape closure area is not possible. Additionally, NMFS is aware that other parties may review the same data and conclude that a different area and/or different time would result in fewer sea turtle takes. This action is selected because of the expected reduction in bycatch of loggerhead and leatherback sea turtles, and therefore bycatch mortality, consistent with the intent of this action and National Standard 9. This action is also selected due to the ability of distant water vessels to fish outside the L-shape closed area, in combination with line clippers and dipnets, to alter fishing practices if a sea turtle is taken.

Not Selected At This Time: Closure of NED area to pelagic longlining from October through December

This alternative would close the NED area to pelagic longline fishing from October through December to reduce potential interactions between longline gear and loggerhead and leatherback sea turtles. This alternative is based on a reasonable and prudent alternative identified in the June 30, 2000, BO to remove the jeopardy finding for sea turtles; however, as noted previously, NMFS

has reinitiated consultation and is developing a new BO. Compliance with this action will be enforced through the use of United States Coast Guard at-sea resources, such as cutter patrols and fly-overs.

Ecological Impacts

Observer and logbook data from pelagic longline vessels in the NED area in the third and fourth quarters (July to December) show high levels of sea turtle bycatch over the past several years. For example, for 1998 and 1999 combined, the NED area accounted for approximately 80 and 70 percent of loggerhead and leatherback takes in the pelagic longline fishery, respectively (see Table 5.1). Additionally, in many cases, two or more sea turtles have been caught per longline set in the NED area, which indicates that pelagic longline fishing in this area poses a potentially greater risk to listed species of sea turtles than pelagic longline fishing in other areas (where multiple turtle takes per set are less frequent; Hoey and Moore, 1999). By closing the entire NED area from October to December to this fishing gear, a substantial portion of sea turtle interactions with pelagic longline gear would be eliminated.

Impacts of this alternative on target and other bycatch species, such as swordfish and blue sharks, respectively, may be minimal as foreign fishing fleets expand fishing effort into the NED area. Accordingly, Atlantic-wide landings of target species and interactions with bycatch species may not decrease but may actually increase if foreign fishing effort increases due to a closure of the NED area from October to December to U.S. pelagic longline fishing,

Economic and Social Impacts

The NED area supplies the United States with approximately 19.5 percent of all the swordfish landed by the U.S. Atlantic pelagic longline fleet per year. Closure of the NED area from October to December would have substantial economic and social impacts directly on distant water fleet vessel owners, captains, and crew of the distant water swordfish and tuna segment of the Atlantic pelagic longline fleet and its entire support base (processors, gear suppliers, bait suppliers, communities, etc). Distant water vessel owners, captains, and crew indicated that they would either relocate to other fishing areas that remain open (Caribbean, South Atlantic, western Gulf of Mexico), re-flag their vessels under another nation, re-rig their vessels to continue fishing for HMS, find alternate fisheries, or discontinue fishing.

Other impacts would include loss of business to dealers that purchase fish from distant water fleet; families that work or own the distant water fishing vessels that would have to either relocate, re-flag, re-rig or discontinue fishing; and indirect impacts on the local communities that support the distant water pelagic longline fleet. A closure is also likely to impact consumers as additional swordfish would need to be imported or landed in areas that have lower swordfish catch rates, leading to increased fishing costs. As a result of the drop in domestic supply, U.S. consumers might notice an increase in price as well as a decrease in quality (less fresh product, less quality control), so there could be a decrease in consumer surplus and therefore a decrease in net economic benefit.

Conclusion

This alternative is not selected at this time because the final action will address the short-term need to reduce bycatch of loggerhead and leatherback sea turtles. Should additional reductions in sea turtle bycatch be required by the reinitiated consultation, more extensive time and/or area closures in the NED area, including closure of the NED area from October to December, may be warranted.

Not Selected At This Time: Prohibit the setting of a pelagic longline north of 35° N. lat. in water temperatures warmer than 64 degrees F and to times no earlier than 10 p.m.

This alternative would restrict both the setting of a pelagic longline in all areas north of 35°N. lat. to water temperatures cooler than 64 degrees F and to times no earlier than 10 p.m. (gear would have to be hauled by 1 p.m. the following day) to reduce potential interactions between longline gear and loggerhead and leatherback sea turtles. This alternative would combine restrictions on setting of gear by water temperature as well as time of day to reduce sea turtle interactions, and was identified in the June 30, 2000, BO as a reasonable and prudent alternative. Compliance with this action will be enforced through the use of United States Coast Guard at-sea resources, such as cutter patrols and fly-overs. In the future, this alternative might be enforced through the use of VMS and sea surface temperature satellite imagery.

Ecological Impacts

Observer and logbook data indicate that both water temperature and time of gear sets may be correlated to sea turtle interactions. Specifically, observer data analyses indicate a reduction in sea turtle catch rates for pelagic longline sets in water temperatures cooler than 68 degrees F (Hoey, 2000; see also Hoey and Moore, 1999). A temperature limit of 64 degrees F was identified in the June 30, 2000, BO to reduce interactions with leatherback sea turtles. Pelagic logbook data do not provide as clear a correlation between temperature and sea turtle takes (Figures 5.2 and 5.3).

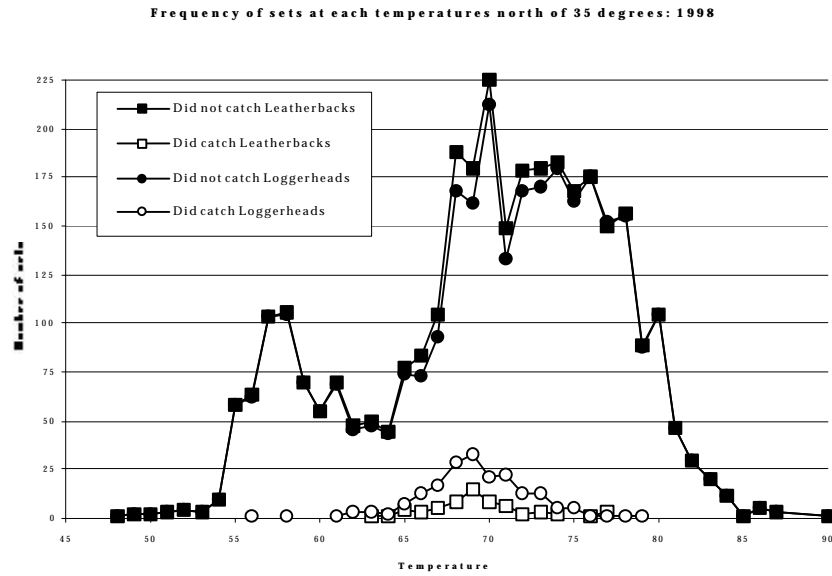


Figure 5.2 Frequency of pelagic longline sets that caught sea turtles and that did not catch sea turtles, as reported in the pelagic logbook for 1998, for areas north of 35° N. lat. (from logbook data).

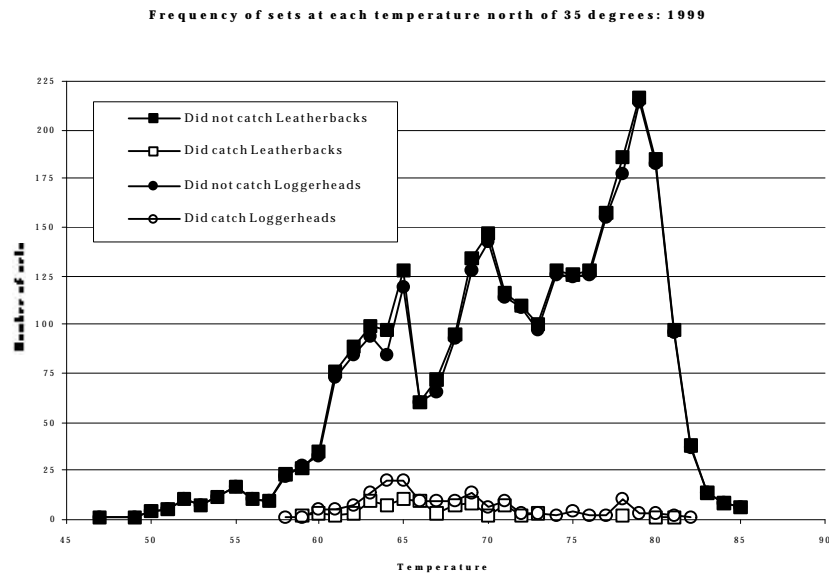


Figure 5.3 Frequency of pelagic longline sets that caught sea turtles and that did not catch sea turtles, as reported in the pelagic logbook for 1999, for areas north of 35° N. lat. (from logbook data).

Observer data also suggest that sets of pelagic longline gear prior to 10 p.m. result in higher sea turtle interactions than sets made at other times (Figures 5.4 and 5.5). In the NED area, Hoey (2000) found that loggerhead (Figure 5.4) and leatherback (Figure 5.5) sea turtles were incidentally captured between 3 p.m. (1500) and 8 p.m. (2000). A restriction on setting pelagic longline gear until 10 p.m. or later may reduce the number of sea turtles taken in the pelagic longline fishery.

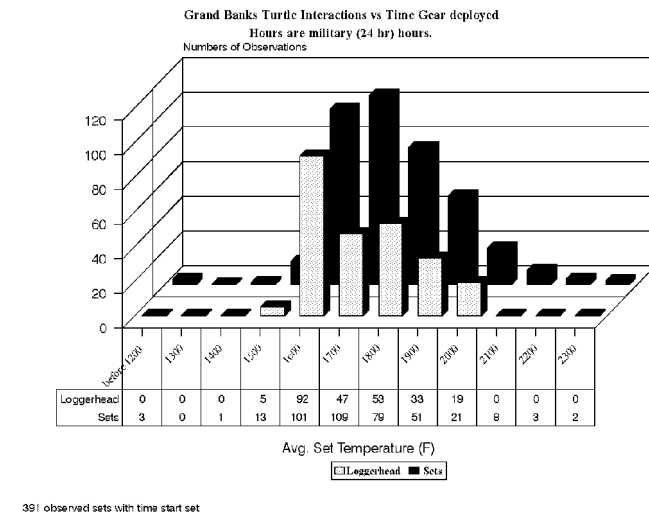


Figure 5.4 Incidental captures of loggerhead sea turtles by time of gear deployment in the NED area (from Hoey 2000).

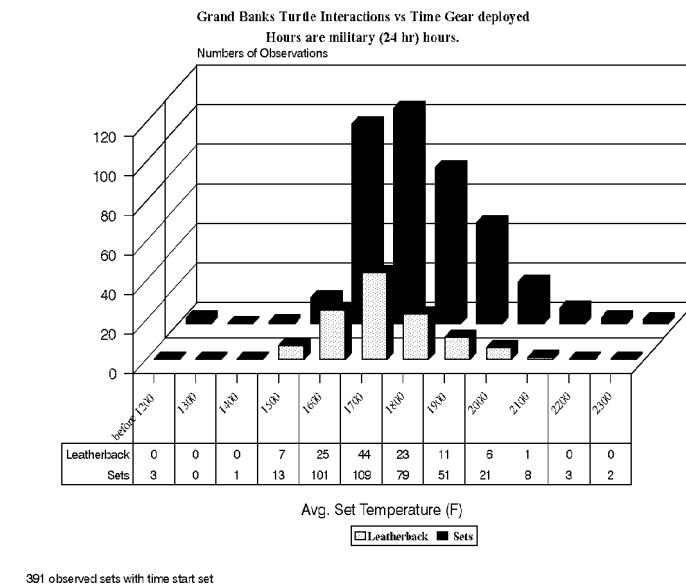


Figure 5.5 Incidental captures of leatherback sea turtles by time of gear deployment in the NED area (from Hoey 2000).

Economic and Social Impacts

This alternative could have substantial economic and social impacts because the majority of pelagic longline sets are made in water temperatures warmer than 64 degrees F and because directed tuna longline sets are made between 2 a.m. and noon. Accordingly, pelagic longline fishermen would likely have to alter their fishing practices substantially in order to maintain target catches, if possible.

Directed swordfish longline trips would likely experience increased costs as more time would have to be spent searching for suitable water temperatures, perhaps before each set if environmental conditions were highly variable. Furthermore, water temperatures cooler than 64 degrees F may not be available in many areas, such that long transits to other areas may be required at considerable economic costs, (increased fuel for long steams, the need to carry more supplies for longer trips), social costs (increased length of trips, less stable fishing conditions), and safety at sea concerns as vessels may be pushed further offshore to find suitable water temperatures. Comments received during scoping workshops indicated that at certain times of the year, water temperatures cooler than 64 degrees F may only be available in offshore areas such as the Flemish Cap or beyond.

Numerous fishermen at the scoping workshops stated that this alternative would essentially eliminate the directed tuna longline fishery north of 35° N. lat. as it currently operates and would have immediate and significant economic and social impacts directly on directed tuna longline vessel owners, captains, and crew and its entire support base (processors, gear suppliers, bait suppliers, communities, etc). Directed tuna longline vessel owners, captains, and crew would need to either relocate to other fishing areas that remain unrestricted in time of sets (Caribbean, South Atlantic, western Gulf of Mexico), re-rig their vessels to continue fishing for HMS, find alternate fisheries, or discontinue fishing. Other impacts would include loss of business to dealers that purchase fish from directed tuna longline vessels; families that work or own the directed tuna longline vessels that would have to either relocate, re-rig, or discontinue fishing; and indirect impacts on the local communities that support the directed tuna longline fleet.

Conclusion

This alternative is not selected at this time. The final action will address the short-term need to reduce bycatch of loggerhead and leatherback sea turtles. Should additional reductions in sea turtle bycatch be required as a result of the reinitiated consultation, more extensive time and/or water temperature gear restrictions may be warranted.

NMFS received comments during scoping workshops on implementation of the June 30, 2000, BO that gear deployment modifications may be supported by the pelagic longline industry and may be preferable to other alternatives such as time and area closures. Comments also indicated that any temperature restrictions may need to account for real-time fluctuations in water regimes and that relative temperature may be more effective than absolute temperature restrictions. In other words, because water temperatures are continually changing, restricting pelagic longline

fishing from the warmest water available at the time of setting may be more effective than establishing a fixed temperature limit. The effectiveness of a fixed temperature limit will vary with current water temperatures because sea turtles seem to congregate in the warmest water available, not necessarily any specific temperature.

While NMFS continues to consider gear deployment modifications as potential methods to reduce sea turtle interactions, NMFS believes that further testing of such modifications is necessary to determine their effectiveness. NMFS intends to work with the pelagic longline industry in the near future to conduct testing of gear modifications, including combinations of delaying setting of gear and fishing cooler water temperatures, to assess their impacts on sea turtle bycatch and target catches.

Not Selected At This Time: Prohibit the setting of a pelagic longline in water temperatures greater than 68 degrees F in the NED area

This alternative would restrict setting of pelagic longlines in the NED area to water temperatures 68 degrees F or cooler, but not restrict the times of sets, to reduce potential interactions between longline gear and loggerhead and leatherback sea turtles. This alternative was discussed in detail in Section 7 of the FSEIS (starting at page 7-70) as a single measure to reduce sea turtle interactions and is based in part on observer data analyses indicating a reduction in sea turtle catch rates for pelagic longline sets in water temperatures cooler than 68 degrees F (see also Hoey and Moore, 1999). This alternative was not selected at that time due to uncertainty regarding the impacts on sea turtle bycatch as well as the difficulty of compliance and enforcement of gear setting restrictions in continually changing water temperatures.

Conclusion

This alternative is still not selected at this time due to the uncertainty of its effectiveness in reducing sea turtle interactions and its impact on target catches. If target catches are substantially reduced, fishermen may offset that reduction in ways that may either negate any decrease or actually increase sea turtle interactions (extend the length of the mainline, increase soak time, fish more total hooks per set, increase the number of lightsticks per set). Furthermore, bycatch of other species (e.g., blue sharks) may increase as fishing patterns shift to cooler water temperatures.

NMFS received comments during scoping workshops on implementation of the June 30, 2000, BO that gear deployment modifications may be supported by the pelagic longline industry and may be preferable to other alternatives such as time and area closures. Comments also indicated that any temperature restrictions may need to account for real-time fluctuations in water regimes and that relative temperature may be more effective than absolute temperature restrictions (see above).

While NMFS continues to consider gear deployment modifications as potential methods to reduce

sea turtle interactions, NMFS believes that further testing of such modifications is necessary to determine their effectiveness. NMFS intends to work with the pelagic longline industry in the near future to conduct testing of gear modifications, including fishing cooler water temperatures, to assess their impacts on sea turtle bycatch and target catches.

Not Selected At This Time: Prohibit the setting of pelagic longline gear between 3 p.m. and 9 p.m.

This alternative would restrict the times, but not the temperatures, that pelagic longlines could be set to reduce potential interactions between longline gear and loggerhead and leatherback sea turtles. This alternative was discussed in detail in Section 7 of the FSEIS (starting at page 7-73) as a single measure to reduce sea turtle interactions and was based in part on observer data analyses indicating that longline set times may be correlated with loggerhead and leatherback sea turtle takes (see also Hoey, 1998). This alternative was not selected at that time due to uncertainty regarding the effectiveness of reducing sea turtle interactions and impacts on target catches, as well as concerns that changing the scheduling of longline setting and hauling activities may increase fatigue and may decrease safety at sea.

Conclusion

This alternative is still not selected at this time due to the uncertainty of its effectiveness in reducing sea turtle interactions, its impact on target catches, and its potential impact on safety at sea. If target catches are substantially reduced, fishermen may offset that reduction in ways that may either negate any decrease or actually increase sea turtle interactions (extend the length of the mainline, increase soak time, fish more total hooks per set, increase the number of lightsticks per set).

NMFS received comments during scoping workshops on implementation of the June 30, 2000, BO that gear deployment modifications may be supported by the pelagic longline industry and may be preferable to other alternatives such as time and area closures. While NMFS continues to consider gear deployment modifications as potential methods to reduce sea turtle interactions, NMFS believes that further testing of such modifications is necessary to determine their effectiveness. NMFS intends to work with the pelagic longline industry in the near future to conduct testing of gear modifications, including delaying setting times, to assess their impacts on sea turtle bycatch, target catches, safety at sea.

Not Selected At This Time: Measures to rig longlines so hooks are fished deeper in the water column

This alternative would prohibit gangions or hooks within 240 feet of the float or floatline to reduce potential sea turtle hookings (240 feet is believed to be the mean depth for hooking swordfish). This alternative was discussed in detail in Section 7 of the FSEIS (starting at page 7-

67) and was not selected at that time because of uncertainty regarding the effectiveness in reducing sea turtle interactions and the impacts on target catches, as well as concerns regarding the difficulty in enforcement of such a measure. The FSEIS notes that pelagic longline fishermen might benefit from indicating support for fishing practices that may reduce sea turtle interactions and also encourages fishermen to try test this gear modification for impacts on sea turtle bycatch and target catches.

Conclusion

This alternative is still not selected at this time due to the uncertainty of its effectiveness in reducing sea turtle interactions and its impact on target catches. If target catches are substantially reduced, fishermen may offset that reduction in ways that may either negate any decrease or actually increase sea turtle interactions (extend the length of the mainline, increase soak time, fish more total hooks per set, increase the number of lightsticks per set).

NMFS received comments during scoping workshops on implementation of the June 30, 2000, BO that gear deployment modifications may be supported by the pelagic longline industry and may be preferable to other alternatives such as time and area closures. Furthermore, some comments received did indicate support for exploring methods to fish hooks deeper in the hopes of reducing sea turtle bycatch. While NMFS continues to consider gear deployment modifications as potential methods to reduce sea turtle interactions, NMFS believes that further testing of such modifications is necessary to determine their effectiveness. NMFS intends to work with the pelagic longline industry in the near future to conduct testing of gear modifications, including fishing hooks deeper, to assess their impacts on sea turtle bycatch and target catches.

Not Selected At This Time: No action (status quo)

This alternative would maintain existing regulations for the pelagic longline fishery in the Atlantic Ocean and Gulf of Mexico. Some of these regulatory measures include: the MAB time/area closure for bluefin tuna; the DeSoto Canyon, Florida east coast, and Charleston Bump time/area closures for swordfish and billfish; limited access for swordfish, tuna, and sharks; and restrictions on retention for swordfish, bluefin tuna, yellowfin tuna, bigeye tuna, and sharks. Currently, commercial vessels utilizing pelagic longline gear are prohibited from retaining, possessing or selling all Atlantic billfish and Atlantic swordfish under 33 pounds dw. This alternative would not be expected to reduce sea turtle bycatch from current levels.

Ecological Impacts

The status quo alternative would not change current fishing practices in the Atlantic pelagic longline fleet. The status quo alternative would not reduce sea turtle bycatch.

Economic and Social Impacts

The status quo alternative would not change the current costs of commercial fishing, nor of any of the associated support industries. Marketing costs might increase in the future under the status quo if the current public perception of the pelagic longline fishery results deteriorates. The pelagic longline fishermen and dealers might need to increase marketing efforts in order to maintain sales and/or prices of swordfish. No changes in fishing practices or behavior of pelagic longline fishermen would be expected under the status quo alternative.

This alternative would have the least amount of economic and social impact on pelagic longline fishermen and their respective communities of any alternatives considered in this document in the short-term, because this alternative would not change current management of the U.S. pelagic longline fishery in the Atlantic Ocean. However, because the status quo does not reduce sea turtle bycatch and would continue to have negative impacts on sea turtle recovery, this alternative would likely have direct negative impacts on pelagic longline vessel owners, captains, crew, and dealers as well as indirect negative impacts on fishing communities in the medium- to long-term if the fishery must be closed to reduce impacts on sea turtles.

Conclusion

The status quo alternative is rejected because it does not reduce sea turtle bycatch, and would likely result in greater restrictions on pelagic longline fishing in the medium- to long-term if no action is taken in the short-term.

Not Selected At This Time: Prohibit use of pelagic longline gear by U.S.-flagged fishing vessels in the Atlantic Ocean, Gulf of Mexico, and Caribbean Sea

This alternative would prohibit the use of pelagic longline gear in the Atlantic Ocean, Gulf of Mexico, and Caribbean Sea HMS fisheries at all times. This alternative would eliminate sea turtle bycatch and bycatch mortality in this fishery. This alternative was discussed in detail in Section 7 of the FSEIS (starting at page 7-49) and was rejected due to the availability of other alternatives that would meet conservation requirements with less severe economic and/or social impacts. The FSEIS noted that landings of target species such as swordfish, as well as interactions with bycatch species such as sea turtles, would be eliminated from the U.S. portion of the total Atlantic-wide longline fishery, although foreign longline fishing effort may increase in areas beyond the U.S. EEZ such as the NED area. Accordingly, Atlantic-wide landings of target species and interactions with bycatch species may not decrease but may actually increase if foreign fishing effort increases due to elimination of the U.S. pelagic longline fishery.

The FSEIS also notes that abolishing the use of pelagic longline gear by U.S. commercial fishing vessels would have an immediate and significant economic and social impacts directly on pelagic longline vessel owners, captains, and crew that would need to re-rig their vessels to continue fishing for HMS, find alternate fisheries, or discontinue fishing; dealers that purchase fish from pelagic longliners; families that work or own the fishing vessels that would have to either re-rig or

discontinue fishing; and indirect impacts on the local communities that support the pelagic longline fishery. However, importers of HMS fishery products from foreign markets would likely see an increase in business as restaurants, fresh seafood markets, and other businesses would seek alternative sources to replace seafood products previously purchased from U.S. pelagic longline fishermen. As a result of the drop in domestic supply, U.S. consumers might notice an increase in price as well as a decrease in quality (less fresh product, less quality control), so there could be a decrease in consumer surplus and therefore a decrease in net economic benefit.

Conclusion

This alternative is still rejected for reasons mentioned above and discussed in more detail in the FSEIS. Additionally, this alternative is rejected due to the potential expansions in foreign pelagic longline fishing effort that may result in increased bycatch and bycatch mortality of sea turtles in the NED area, which would likely negate the positive impacts of a prohibition of pelagic longline gear in U.S. fisheries.

5.2 Measures to Reduce Post-Release Mortality of Sea Turtles Incidentally Captured

Alternatives discussed in this section examine ways to reduce the post-release mortality of sea turtles taken in the Atlantic pelagic longline fishery through gear requirements.

Final Action: Require line clippers to be used and carried on board all pelagic longline vessels

This action requires all pelagic longline vessels that hold Federal HMS permits to carry on board at all times and to use line clippers that meet NMFS design and performance standards to disentangle gear from incidentally captured sea turtles. This action will reduce the serious injury and/or mortality of sea turtles incidentally captured by reducing or eliminating any gear (monofilament line, rope, etc.) that remains on the sea turtle after its release. This action is consistent with National Standard 9 to reduce bycatch and bycatch mortality, to the extent practicable, and use it to remove gear from incidentally captured turtles.

Ecological Impacts

This action will reduce the amount of externally attached gear from released sea turtles by requiring monofilament lines and ropes to cut from the animal as close to the hook or point of attachment as possible. This action will reduce the serious injury and/or mortality from trailing gear that results from impediments to movement, increased risk of entanglement in other gear, and hook wounds that cannot heal due to attached gear. The reduction in serious injury and/or mortality should contribute to increased turtle recovery of the threatened loggerhead and endangered leatherback sea turtles.

Economic and Social Impacts

This action is expected to have minimal economic and social impacts on fishing practices, costs, or revenues. Comments received during scoping workshops on BO implementation indicated that many fishermen already spend time during gear haulbacks to handle and release turtles with care such that the requirement to use a line clipper would not appreciably alter fishermen's behavior, although some time would likely be required to learn how to use it. The line clipper specifications allow fishermen to fabricate the device from materials they already have or can easily obtain (as opposed to requiring use of a specific device they would have to purchase), as long as it meets NMFS design and performance standards (see Appendix 1 for an example design). The design specifications from the Hawaii pelagic longline fishery, from which the line clipper and dipnet standards were taken, were estimated to cost approximately \$250 for both devices (65 FR 16346, March 28, 2000). To the extent that the line clipper will more quickly release entangled and hooked sea turtles from longline gear, gear haulback times, and fishing costs may decrease. Additionally, an increase in positive media coverage due to improved sea turtle handling and release techniques may improve public perception of fishing practices of the pelagic longline fleet.

Conclusion

This action is selected because of the need to reduce post-release mortality of incidentally captured sea turtles, the ability of line clippers to quickly reduce or eliminate serious injury and/or mortality due to trailing gear, and the minimal gear costs and processing time.

Final Action: Require dipnets to be used and carried on board all pelagic longline vessels

This action requires all pelagic longline vessels that hold Federal HMS permits to carry on board at all times and to use dipnets that meet NMFS design and performance standards to bring small sea turtles on board the vessel to disentangle gear (monofilament line, rope, external hooks, etc.). This action should reduce serious injury or mortality of small sea turtles incidentally captured by facilitating greater removal of gear before release. This action is consistent with National Standard 9 to reduce bycatch and bycatch mortality, to the extent practicable.

Ecological Impacts

This action will reduce the amount of externally attached gear from released sea turtles by facilitating greater gear removal on small turtles. Use of a dipnet that will allow monofilament lines and ropes to be cut from the animal as close to the hook or point of attachment as possible and also facilitate removal of hooks located in sea turtle mouths or beaks. This action will reduce the serious injury and/or mortality on small turtles from remaining hooks or trailing gear that results from impediments to movement, increased risk of entanglement in other gear, and hook wounds that cannot heal due to attached gear. The reduction in serious injury and/or mortality of small turtles should contribute to increased turtle recovery of the threatened loggerhead and endangered leatherback sea turtles. This action would not require large turtles to be brought aboard for disentanglement because more damage may be done to the turtle from bringing it on board than from removing as much gear as possible while it is still in the water. Every situation

will be slightly different and fishermen must use their best judgement to ensure that further damage is not done to the turtle and that the safety of those working around the turtle is ensured.

Economic and Social Impacts

This action is expected to have minimal economic and social impacts on fishing practices, costs, or revenues. Comments received during scoping workshops on BO implementation indicated that many fishermen already spend time during gear haulbacks to handle and release turtles with care such that the requirement to use a dipnet to bring small turtles on board for disentanglement would not appreciably alter fishermen's behavior, although some time would likely be required to learn how to use the dipnet. The dipnet standards allow fishermen to fabricate the device from materials they already have or can easily obtain (as opposed to requiring use of a specific device they would have to purchase), as long as it meets NMFS design and performance standards. The design specifications from the Hawaii pelagic longline fishery, from which the line clipper and dipnet standards were taken, were estimated to cost approximately \$250 for both devices (65 FR 16346, March 28, 2000). The line clipper must be able to reach sea turtles in the water, if they are too big to be brought on board the vessel, and must have a blade that is appropriate to cut the gear being utilized by the pelagic longline fleet. The dipnet must have a handle of at least six feet and be able to support a minimum of 100 pounds to enable fishermen to lift a captured turtle on board. To the extent that use of dipnets will require more time during gear haulbacks to bring turtles on board, fishing costs may increase. However, the time required to bring small turtles on board and therefore, any increase in fishing costs, are expected to be minimal. Furthermore, an increase in positive media coverage due to improved sea turtle handling and release techniques may improve public perception of fishing practices of the pelagic longline fleet.

Conclusion

This action is selected because of the need to reduce post-release mortality of incidentally captured sea turtles, the ability of dipnets to facilitate gear removal and reduce serious injury and/or mortality due to trailing gear, and the minimal gear costs and processing time.

Not Selected At This Time: Require dehooking devices to be used and carried on board all pelagic longline vessels

This alternative would require all pelagic longline vessels that hold Federal HMS permits to carry on board at all times and to use dehooking devices to remove hooks that are clearly visible externally or in the mouth or beak. If appropriate design specification were available, this alternative would reduce serious injury or mortality of incidentally captured sea turtles by reducing the number of hooks that remain embedded in sea turtles after release.

Ecological Impacts

This alternative would reduce serious injury and/or mortality of incidentally captured sea turtles

by removing a higher percentage of externally visible or mouth/beak hooks than currently occurs. To the extent that external or mouth/beak hooks contribute to post-release mortality, this alternative would contribute to sea turtle recovery unless damage was done to the turtle during the dehooking process. This alternative would not require deeply embedded or ingested hooks to be removed due to concerns that more damage may be done to the turtle by removing the hook than by leaving it in place.

Economic and Social Impacts

This alternative would impose minimal economic and social costs in sea turtle handling and release costs due to the final actions that require line clippers and dipnets to be carried on board already. This alternative would require some additional time during gear haulbacks to ensure externally visible or mouth/beak hooks were removed. The costs associated with this alternative would depend on whether a specific dehooking device would be required or, as with the required line clippers and dipnets, design specifications would be established that allow fishermen to develop their own device. As stated in the HMS FMP, most dehooking devices designed to release large fish cost between \$45 and \$90. As with the required line clippers and dipnets, an increase in positive media coverage due to improved sea turtle handling and release techniques may improve public perception of fishing practices of the pelagic longline fleet.

Conclusion

This alternative is not selected at this time due to the lack of appropriate design specifications that would allow safe removal of externally visible or mouth/beak hooks. Further research needs to be conducted on gear configurations that would be easily handled and learned by fishermen and that would be sure to do no further damage to the hooked turtles before design specifications can be developed. NMFS intends to work with the pelagic longline industry in the near future to conduct testing of gear configurations, including use of dehooking devices, to assess their effectiveness on reducing sea turtle post-release mortality.

Not Selected At This Time: No action (status quo)

This alternative would maintain current regulations regarding gear requirements and would not implement any additional measures to require pelagic longline vessels to carry and use devices that remove gear from sea turtles before release.

Ecological Impacts

Current levels of sea turtle bycatch mortality would not be affected through an enforceable management measure. Therefore, no changes in post-release mortality of incidentally captured sea turtles would be expected.

Economic and Social Impacts

The status quo alternative would not change the current fishing practices, costs or revenues of the Atlantic pelagic longline fishery. This alternative would have the least amount of economic or social impacts in the short-term of the alternatives discussed. Although the medium- to long-term impacts may be more severe (relative to the final actions) as sea turtle populations decline.

Conclusion

This alternative is rejected because of the need to reduce sea turtle mortality in the short-term.

Not Selected At This Time: Require use of corrodible hooks on all pelagic longline gear

This alternative would require all pelagic longlines on vessels that hold Federal HMS permits to be rigged with corrodible hooks only. The use or possession of non-corrodible hooks would be prohibited if a pelagic longline was on board. This alternative was identified in the June 30, 2000, BO as a method to reduce serious injury and/or mortality of incidentally captured sea turtles.

Ecological Impacts

This alternative may increase the survival of released sea turtles by requiring pelagic longline gear to be rigged with hooks that corrode quickly and thereby reduce the amount of time any ingested or deeply hooks would remain embedded in the turtle after its release. Depending on how quickly corrodible hooks dissolve, this alternative may reduce the serious injury and/or mortality of gear not readily removed from hooked sea turtles.

Economic and Social Impacts

Depending on how “corrodible” is defined, this alternative could result in increased costs and decreased revenues for pelagic longline vessel owners, captains, and crew. If corrodible is defined as non-stainless, then the increased costs and decreased revenues may be minimal because many pelagic longline vessels are currently rigged with non-stainless hooks already. Those vessels that are currently rigged with stainless hooks would have increased direct costs of replacement hooks and crew time to re-rig the gear. As corrodible hooks would dissolve more quickly than stainless hooks, then those vessels would also have continued replacement hook and re-rigging costs.

However, if corrodible is defined as a specific hook type, hook coating, or alloy content, then economic and social impacts could be substantial. Economic cost increases could range from high initial hook replacement and re-rigging costs for all pelagic longline vessels upon implementation of the requirement to long-term increased hook replacement costs if the corrodible hooks are more expensive to manufacture and would need to be replaced more frequently due to their higher corrodibility. Revenues could decrease if the corrodible hooks are not commercially available so that fishermen could not fish until new hooks were manufactured or if target catches decrease as if corrodible hooks cannot retain swordfish or tuna as well as currently used hook types.

Conclusion

This alternative is not selected at this time due to the uncertainty regarding the definition of “corrodibility” and its enforceability, its effectiveness in reducing sea turtle post-release mortality, and its impact on target catches. If target catches are substantially reduced, fishermen may offset that reduction in ways that may either negate any decrease or actually increase sea turtle interactions (extend the length of the mainline, increase soak time, fish more total hooks per set, increase the number of lightsticks per set).

NMFS received comments during scoping workshops on implementation of the June 30, 2000, BO that gear deployment modifications may be supported by the pelagic longline industry and may be preferable to other alternatives such as time and area closures. While NMFS continues to consider gear deployment modifications as potential methods to reduce sea turtle interactions, NMFS believes that further testing of such modifications is necessary to determine their effectiveness. NMFS intends to work with the pelagic longline industry in the near future to conduct testing of gear modifications, including use of corrodible hooks, to assess their impacts on sea turtle bycatch and target catches.

Not Selected At This Time: Require use of circle hooks on all pelagic longline gear

This alternative would require that all pelagic longlines on vessels that hold Federal HMS permits be rigged with circle hooks. The use or possession of straight shank or “J” hooks would be prohibited if a pelagic longline was on board. This alternative was discussed in detail in Section 7 of the FSEIS (starting at page 7-74) and was not selected at that time due to uncertainty regarding the effectiveness of reducing sea turtle bycatch and impacts on target catches (NMFS received comments from fishermen during scoping workshops that the use of circle hooks may reduce the amount of swordfish caught by twenty percent), and concerns that the measure would be difficult to enforce.

Conclusion

This alternative is not selected at this time due to the uncertainty of its effectiveness in reducing sea turtle interactions (bycatch and post-release mortality) and its impact on target catches. If target catches are substantially reduced, fishermen may offset that reduction in ways that may either negate any decrease or actually increase sea turtle interactions (extend the length of the mainline, increase soak time, fish more total hooks per set, increase the number of lightsticks per set).

NMFS received comments during scoping workshops on implementation of the June 30, 2000, BO that gear deployment modifications may be supported by the pelagic longline industry and may be preferable to other alternatives such as time and area closures. While NMFS continues to consider gear deployment modifications as potential methods to reduce sea turtle interactions, NMFS believes that further testing of such modifications is necessary to determine their

effectiveness. NMFS intends to work with the pelagic longline industry in the near future to conduct testing of gear modifications, including use of circle hooks, to assess their impacts on sea turtle bycatch and target catches.